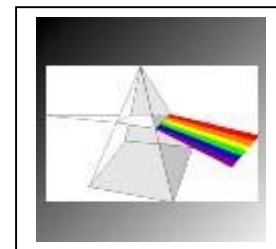
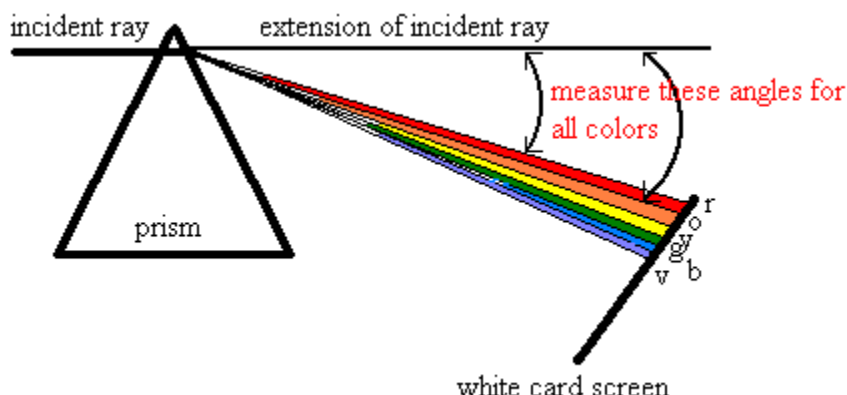


## Activity #5: Visible Light—Student's Copy-ANSWER KEY



Each student's diagram should be similar to the one below (without the actual coloration). It should include the incident ray, the extended incident ray, and the letter-labeled colors observed.



The student's data chart should be similar to the one below. The actual angles of refraction recorded may differ for each student—depending upon the angle of the incident beam striking the prism. However, the recorded angles should increase similarly from red (the color least refracted) to violet (the color refracted the greatest amount).

color produced by the separation of white light	angle of refraction (degrees)	wavelength of color ( $\mu\text{m}$ )
Red	30	.7
Orange	30.5	.63
Yellow	31	.61
Green	31.5	.55
Blue	32	.45
Violet	32.5	.39

### Analysis questions: (typical responses)

1. From observations made in this activity, of what colors is white light composed? The colors red, orange, yellow, green, blue and violet were observed
2. What piece of optical equipment was necessary to separate white light into its component colors? The white light from our source was separated by a prism.
3. Describe what must be occurring within the prism to cause the white light to separate into the various colors of the visible spectrum. Each different wavelength of light must be getting bent (refracted) by different amounts in order to produce the separation.

4. State the relationship between the wavelength of each colored light and the degree to which it is refracted as it passes through the prism. (Ex. **The longer wavelengths of light appear to be refracted less (more, less, the same as) than the shorter wavelengths of light.**
5. Infrared light is also known as heat (thermal) energy. From information given in the “Visible Light Region of the Electromagnetic Spectrum” chart above, where on your diagram (Procedure step #4) would you expect this invisible infrared energy to appear? **The infrared light would appear just above the red band of light in the visible spectrum.**
6. Describe a test you could perform to prove that the infrared energy is, in fact, where you predicted on your diagram. **A thermometer or thermistor probe could be placed just beyond the visible red band in our spectrum. It should indicate a slight rise in temperature when placed in the infrared zone.**
7. If sunlight were used as our light source in this activity, where on your diagram would you expect its invisible ultraviolet light to appear? **The ultraviolet would appear just below our violet band of color.**